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Metabolic profiling of streptomyces strains from different types of Tatarstan soils using GEN III omnilog system

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Abstract

Isolation and evaluation of the ability of various actinomycetes to produce bioactive secondary metabolites is a long-term and expensive procedure. Many species of actinomycetes have similar morphological characteristics, therefore phenotyping of these microorganisms requires methods of metabolic profiling to be applied. Analysis of metabolic pathways can help in both the taxonomic identification of a microorganism and the assessment of its ability to produce a variety of secondary metabolites. In this paper, we first carried out metabolic profiling of Streptomyces isolates from different types of Tatarstan soils using GEN III OmniLog system. We also performed a phylogenetic analysis of strains. We assigned strains to the genus Streptomyces, and identified species such as Streptomyces fimicarius, Streptomyces badius, Streptomyces mirabilis and Streptomyces violaceoruber. We have shown that the system GEN III OmniLog® II Combo Plus is a powerful tool to get an overview of the active metabolic pathways of actinomycetes and can be used for high-performance analysis. It can also provide useful information to clarify the phylogenetic position of a microorganism. We can use both the profiles of substrate utilization, growth, secondary metabolites, and anti-microbial profiles, obtained by using the GEN III OmniLog® II Combo Plus system, in the microbial drug development programs.

Keywords

16S rDNA, GEN III omnilog system, Metabolic profiling, Streptomyces